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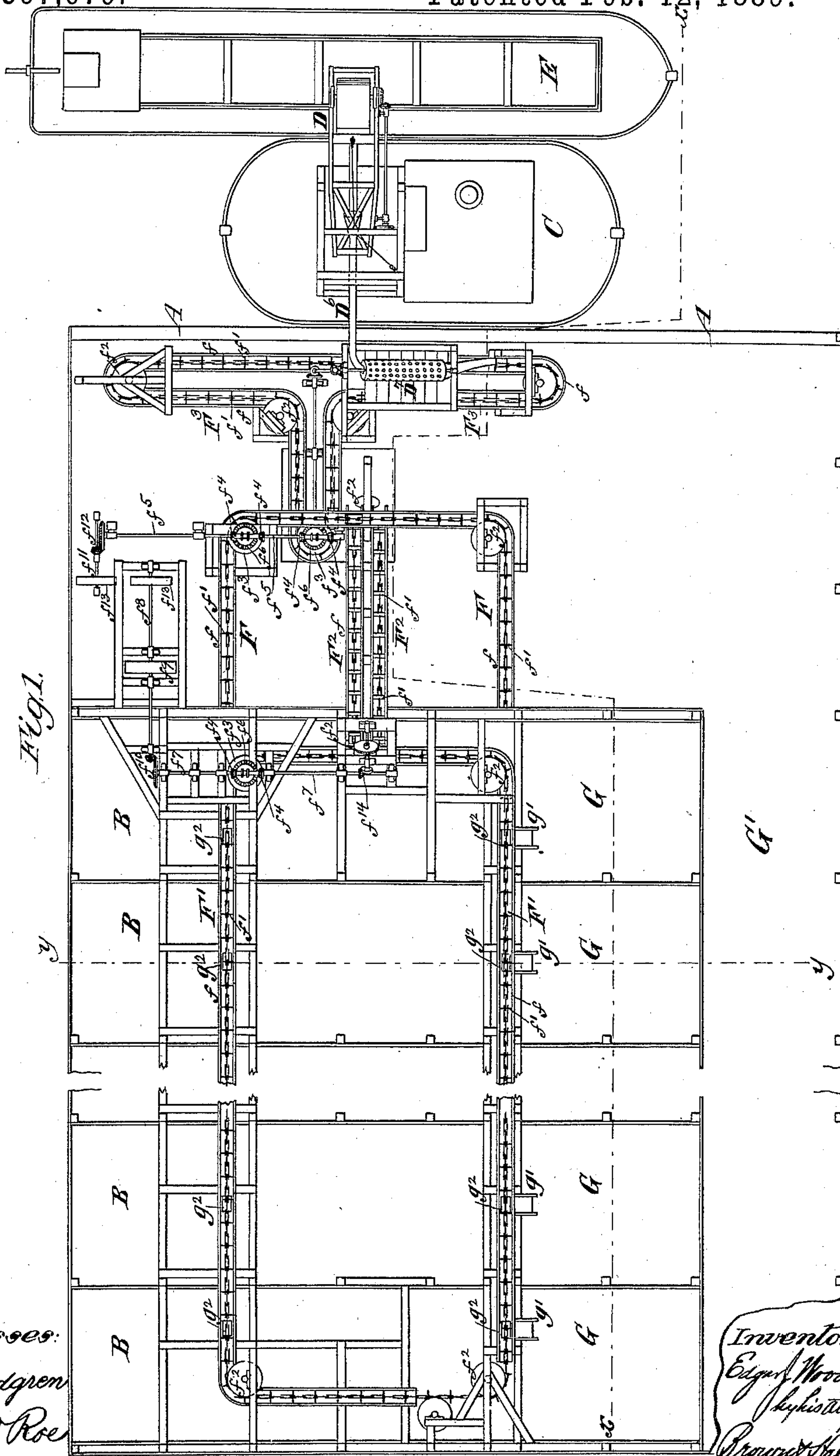
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E. J. WOOD.

APPARATUS FOR HANDLING AND DISTRIBUTING GRANULAR OR LUMPY SUBSTANCES.

No. 397,679.

Patented Feb. 12, 1889.



Witnesses:
O. Sundgren
Jas W Roe

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(No Model.)

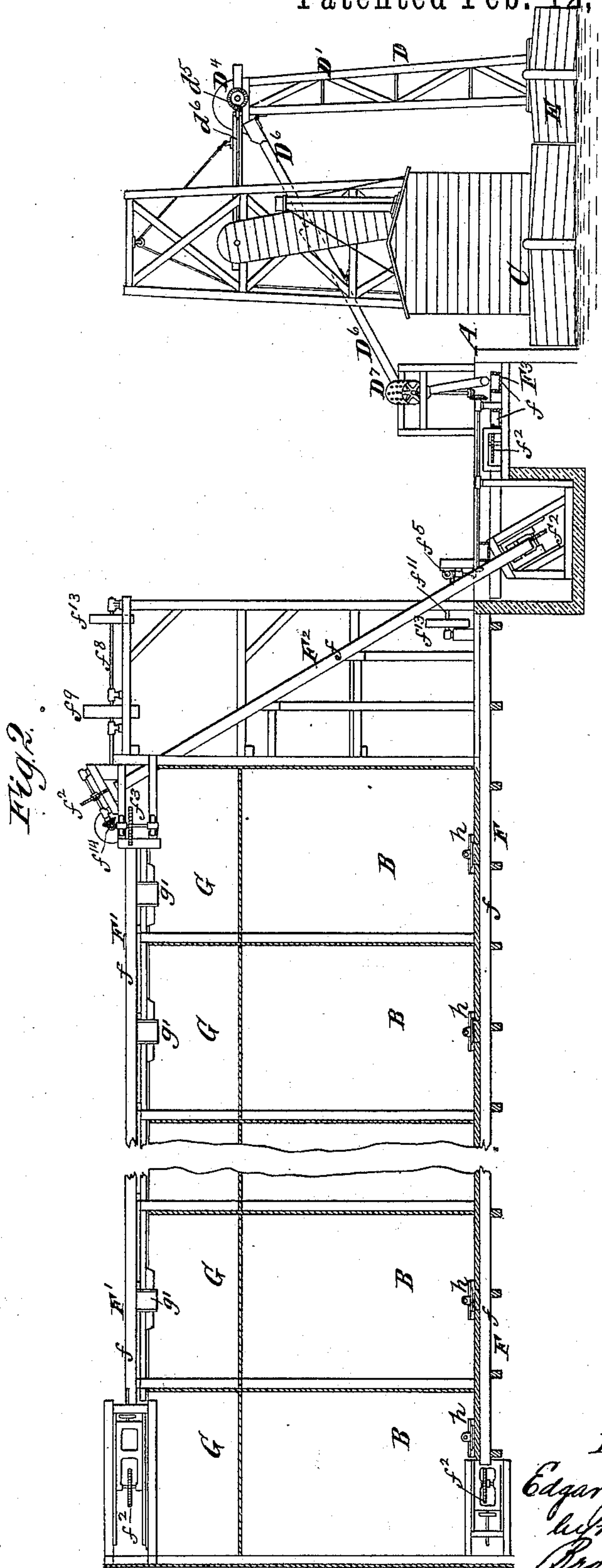
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Witnesses:
O. Sundgren.
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Inventor:
Edgar J. Hood
by his atty
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(No Model.)

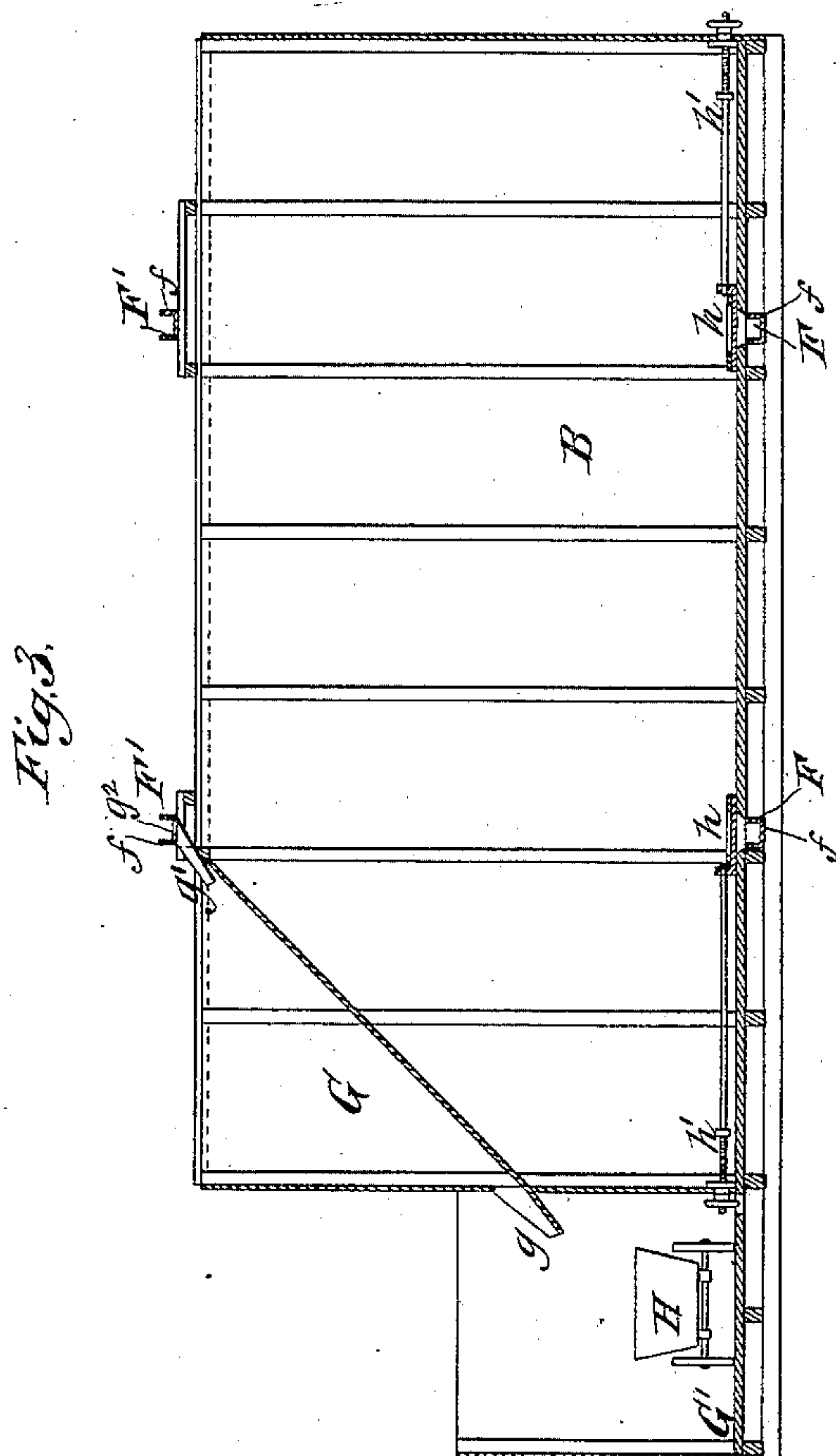
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(No Model.)

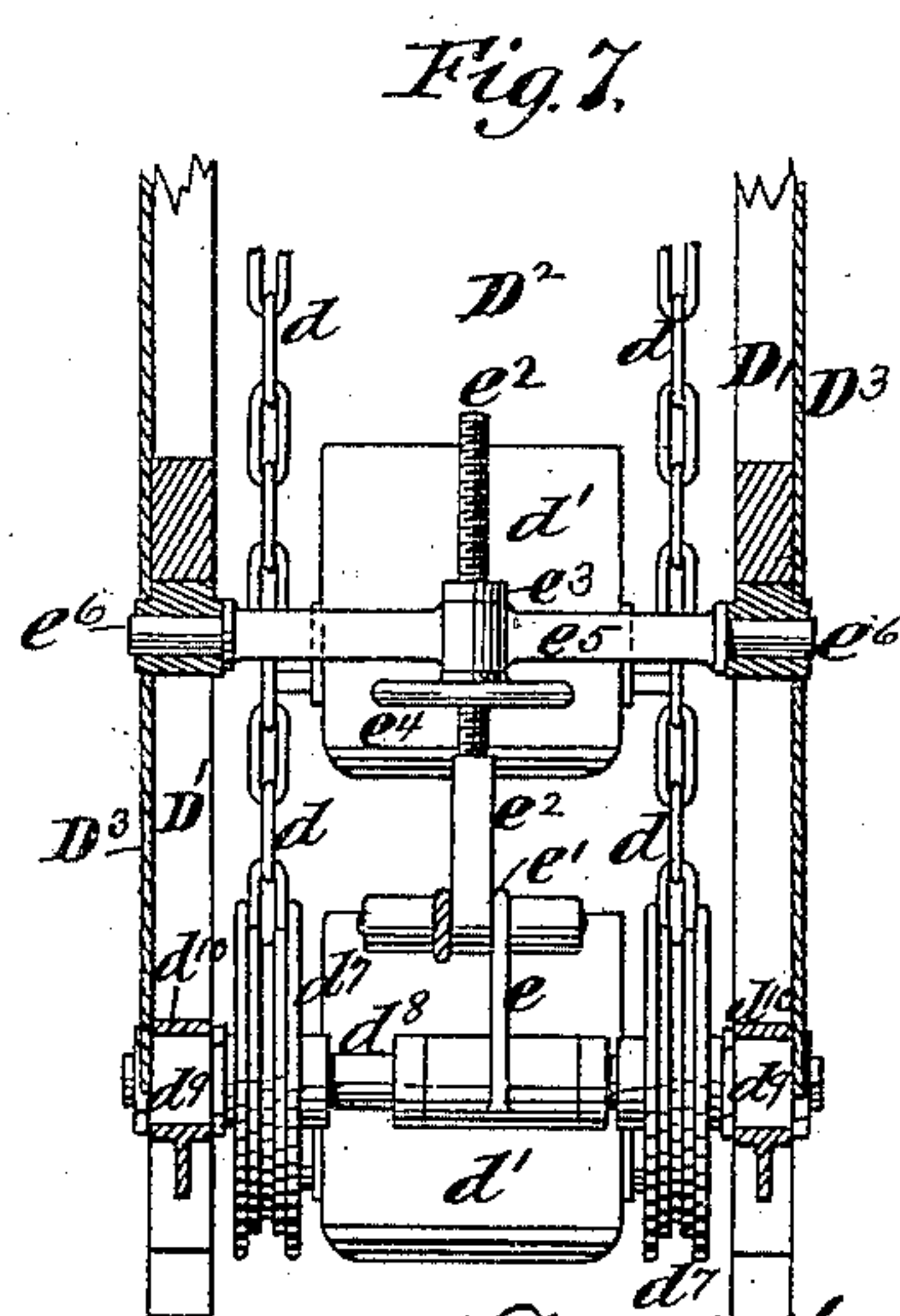
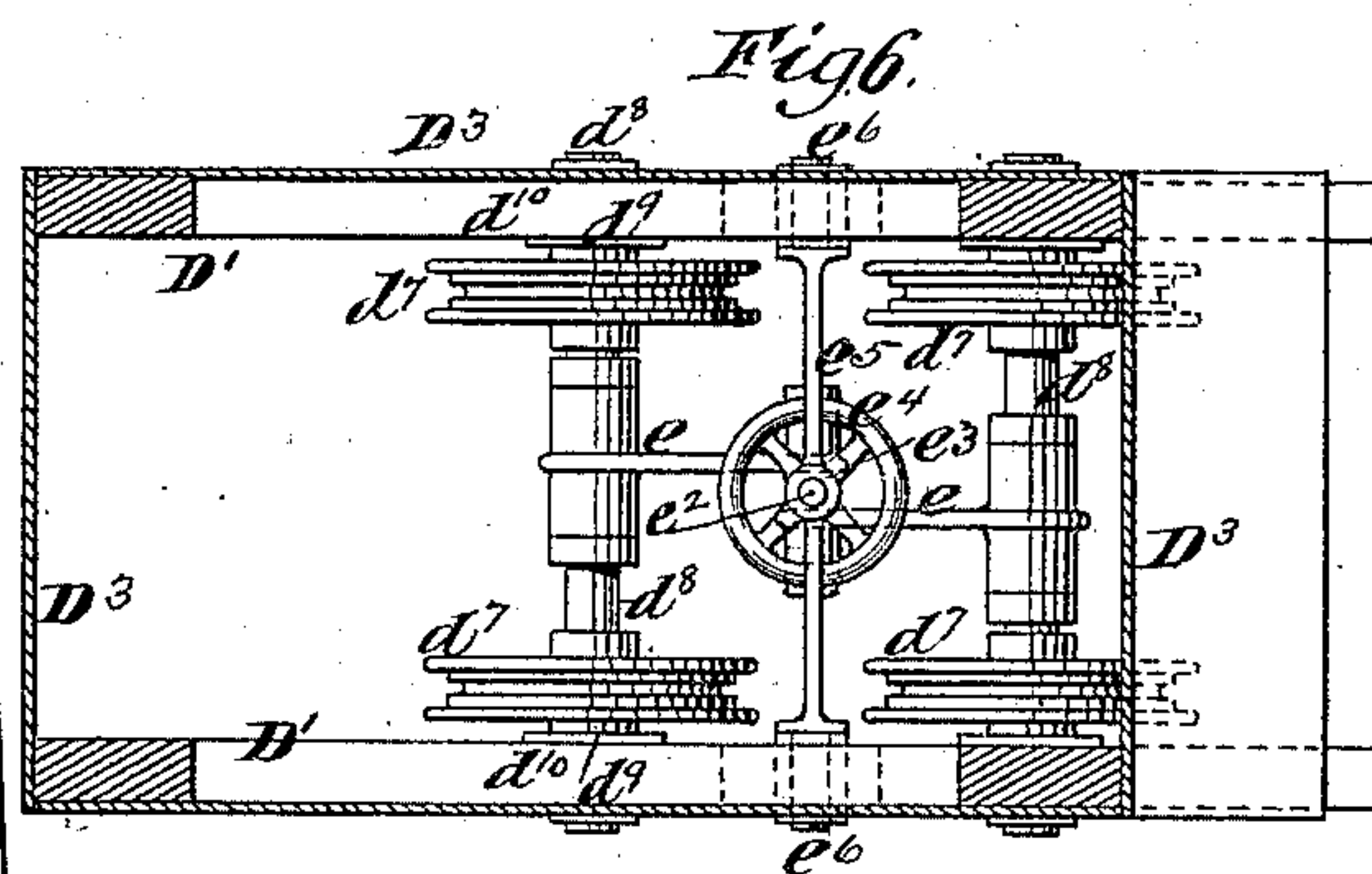
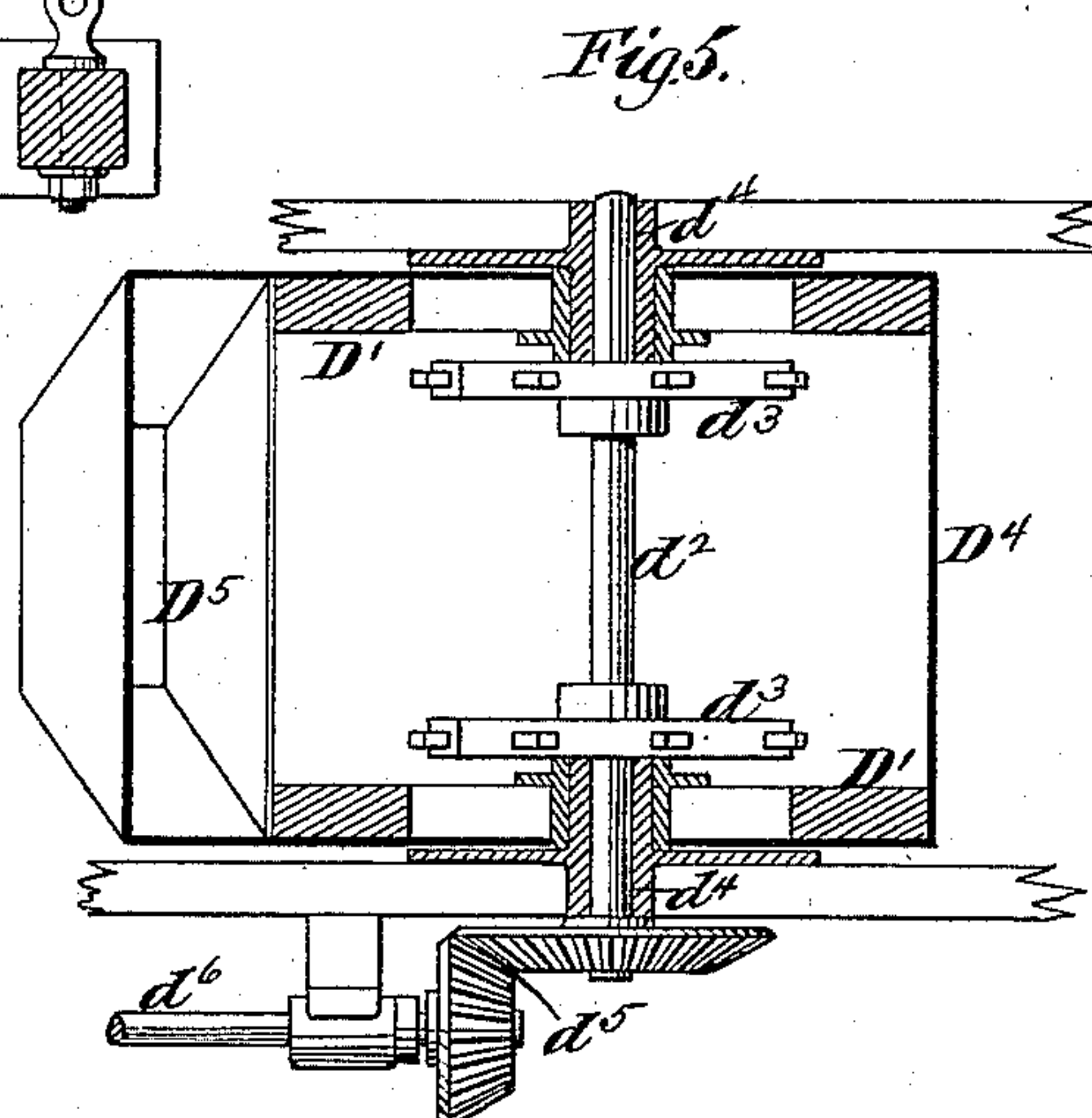
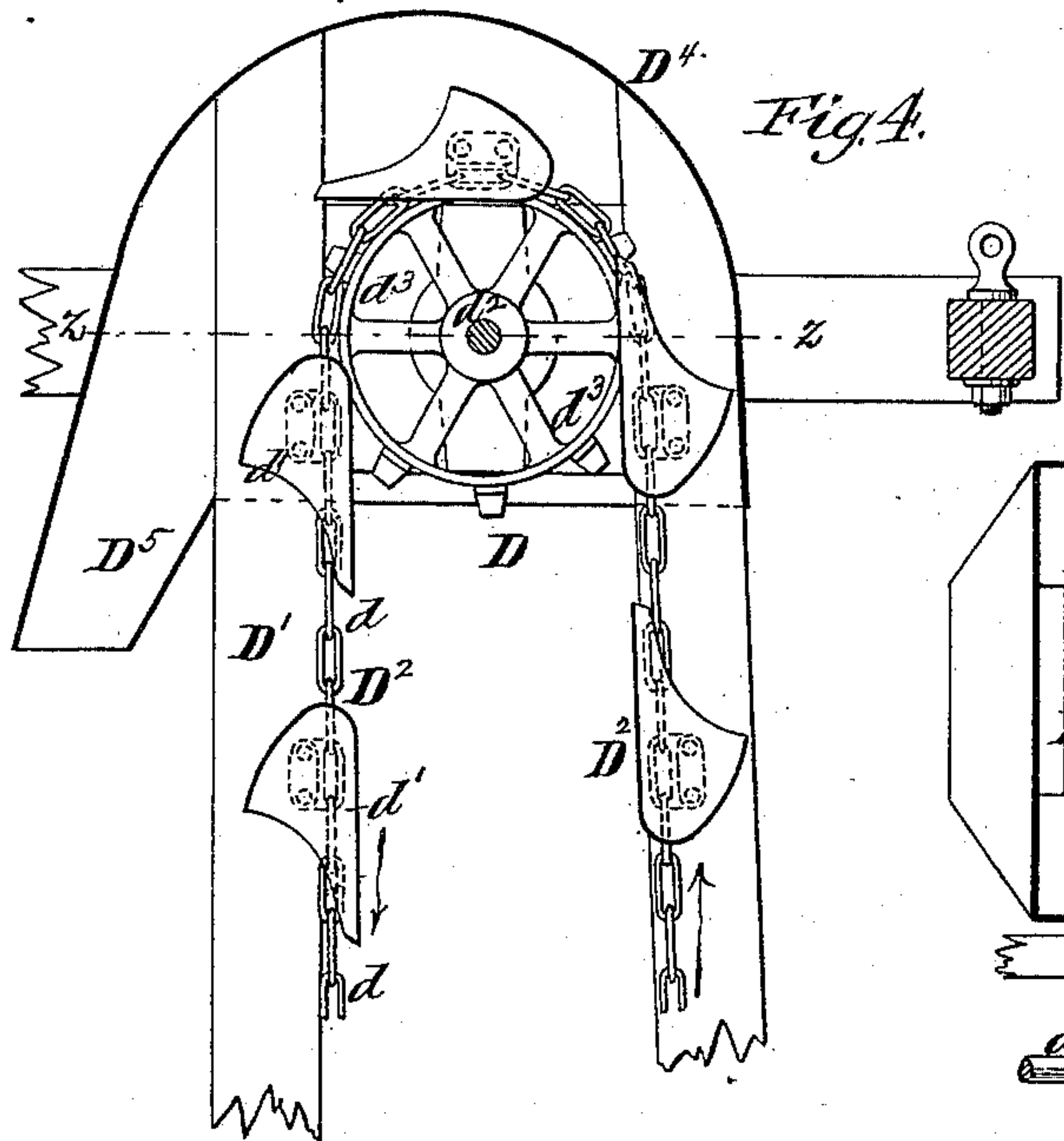
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APPARATUS FOR HANDLING AND DISTRIBUTING GRANULAR OR LUMPY SUBSTANCES.

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Inventor } Edgar Wood
by his attys } Brown & Hall

UNITED STATES PATENT OFFICE.

EDGAR J. WOOD, OF BROOKLYN, NEW YORK.

APPARATUS FOR HANDLING AND DISTRIBUTING GRANULAR OR LUMPY SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 397,679, dated February 12, 1889.

Application filed April 7, 1888. Serial No. 269,913. (No model.)

To all whom it may concern:

Be it known that I, EDGAR J. WOOD, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Apparatus for Handling and Distributing Granular or Lumpy Substances, of which the following is a specification.

My invention may be embodied in apparatus for elevating or handling and distributing various substances or materials of a granular or lumpy character, but is at present more particularly intended for use in handling and distributing coal.

In coal-yards from which carts are filled it is common to provide a series of bins arranged side by side for receiving coal of different sizes or kinds, and I also provide a series of elevated pockets which have each a delivery-spout at its bottom, and which is at the desired height to load a cart therefrom; and a further object of my invention is to provide for delivering coal or other material which is raised to the top of the bins either into any one of the pockets or into any one of the bins, and also to provide for taking coal from any one of the bins and transferring it to any other one of the bins or to any one of the pockets.

The invention is hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan of a coal-yard embodying my invention, including a canal-boat and an elevator boat or float lying at the wharf adjacent thereto. Fig. 2 is a longitudinal section upon the irregular plane indicated by the dotted line $x x$, Fig. 1. Fig. 3 is a transverse section upon about the plane indicated by the dotted line $y y$, Fig. 1. Fig. 4 is a vertical section of an elevator, a portion of the height being broken away and embodying my invention. Fig. 5 is a horizontal section upon about the plane indicated by the dotted line $z z$, Fig. 4. Fig. 6 is a horizontal section upon about the plane indicated by the dotted line $* *$, Fig. 4; and Fig. 7 is a nearly vertical section upon about the plane indicated by the dotted line $s s$, Fig. 4. Figs. 4 to 7 are upon a larger scale than Figs. 1, 2, and 3, and similar letters of reference designate corresponding parts in all the figures.

Referring first to Figs. 1, 2, and 3, A designates a wharf at which boats may land, and upon which the coal-yard is situated.

B designate coal-bins, which are arranged to form a series of as many as may be desired, and the length of the series is, as here shown, broken away to reduce the size of the figure.

C designates an elevator boat or float supporting an elevator structure and means for driving the same, and including an elevator-leg, D, which, as here shown, depends into a canal-boat, E, from which coal is to be taken. The elevator-leg D, which is supported by the elevator structure upon the scow or float C, is driven from the machinery which is upon the scow or float C, and a preferable construction of the elevator-leg and the elevating mechanism within it is represented in Figs. 4 to 7, inclusive, to which I shall now refer. The elevator-leg D includes a frame-work, D', in which operates an endless chain of scoops or buckets, D². At the lower portion of the frame-work D' the same may be inclosed by a casing, D³, and at the upper portion is a hood or casing, D⁴, provided with a delivery-spout, D⁵. As here represented, the chain of buckets or scoops D² is composed of two parallel endless chains, d , between which the buckets or scoops d' are hung.

At the top of the frame-work D' is a shaft, d^2 , upon which are chain-wheels d^3 , which support and drive the chains d . The shaft d^2 is supported in suitable bearings, d^4 , upon the frame-work D', and is driven through bevel-wheels d^5 from a shaft, d^6 , which receive motion from the machinery upon the elevator scow or float C. By motion thus imparted to the shaft d^2 and the supporting and driving wheels d^3 the endless chain of buckets or scoops D² is caused to move in the direction indicated by the arrows in Fig. 4, and thus the buckets or scoops d' are passed into and through the coal or like material in the boat E, and thence ascend loaded, and as they pass the wheels d^3 at the top of the elevator-leg the buckets or scoops d' deliver their contents through the delivery-spout D⁵, and thence the coal passes down the inclined chute D⁶, and, as here represented, to a coal-screen, D⁷, where by the coal is cleaned or screened.

At the lower part of the frame-work D', instead of a single wheel or pair of wheels for the chain of buckets or scoops D² to pass around,

there are two wheels which rotate in the same plane, or two pairs of wheels which rotate in the same planes. Inasmuch as there are employed two simple chains, d , for supporting or forming the endless chain of scoops or buckets, I employ two pairs of wheels, d^1 , those of each pair being mounted upon shafts d^8 , and those of each pair rotating in the same plane with the wheels of the other pair. Each shaft d^8 is mounted in boxes d^9 , which may slide in channel-ways or slideways d^{10} , secured in the frame-work D' , and, as here shown, these slideways d^{10} have a slightly-inclined direction, as best seen from Fig. 4. The shafts d^8 are free to turn in or have applied to them levers or arms e , which are connected by a middle or center joint, e' , and which form a pair of toggle-levers, the outer joints of which are upon the shafts d^8 , and which have applied to their intermediate joint, e' , an adjusting-screw, e^2 .

The screw e^2 is fitted to a nut, e^3 , which may be turned by a hand-wheel, e^4 , and which is free to turn within a bearing formed in the cross-bar e^5 , journaled at its ends e^6 in bearings attached to the frame-work D' . By turning the nut and hand-wheel e^3 e^4 the toggle-levers e may be deflected more or less or brought more or less nearly into line, and by thus bringing them toward a position in line with each other the pairs of wheels d^1 are spread and the chains d are tightened, so that by this adjustment any slack which may occur in the endless chain of buckets or scoops D^2 through wear may be taken up and the chain maintained taut.

The employment of two wheels, d^1 , rotating in the same plane, or two pairs of such wheels rotating in the same planes, is important, because then the endless chain of buckets or scoops D^2 in passing between the wheels d^1 will be caused to travel in a substantially straight line, as shown in Fig. 4, and will therefore fill with a shovel or scoop-like action, which is distinguished from the ordinary elevators having severally an endless chain of buckets or scoops in which the buckets or scoops describe simply an arc of a circle in passing through the material to fill themselves.

From the screen D^7 the coal is delivered to a horizontal conveyer, F^3 , (best shown in Fig. 1,) and which consists of a trough, f , wherein operates a reversible endless chain or series of scrapers, f' . These scrapers f' , moved in the trough f by the chain which operates them, carries along the coal in the desired direction. This endless chain of scrapers f' passes around guiding and supporting wheels f^2 , and also around a supporting and operating wheel, f^3 , and the supporting or operating wheel f^3 may be turned in either direction by means of bevel-pinions f^4 upon a shaft, f^5 , and which may either of them be shifted into gear with a bevel-wheel, f^6 , upon the shaft of the supporting and operating wheel f^3 . I also provide a lower and approximately hori-

zontal conveyer, F , and a corresponding upper and approximately horizontal conveyer, F' , and I have likewise shown an inclined conveyer or elevator, F^2 , whereby coal or like material may be raised from the level of the lower conveyer, F , to the upper conveyer, F' .

The horizontal and inclined conveyers F F' F^2 may each consist of a trough, f , rectangular in transverse section, and in which is arranged a reversible endless series or chain of scrapers, f' , and the conveyers F F' each have two substantially-parallel runs or arms, as best shown in Figs. 1 and 3, said runs intercommunicating by means of transverse runs, as shown in Fig. 1.

Along one side of the series of bins B are a corresponding series of elevated pockets, G , as best shown in Fig. 3, and along the side of the series of bins and series of pockets is a driveway, G' , along which carts H may be driven to be filled. The pockets G have delivery-outlets g , which are on a level sufficiently high so that coal may pass from them directly into the cart H , as shown in Fig. 3. If desired, the coal may be loaded from the pockets into cars. The lower horizontal conveyer, F , has both its runs or arms extending beneath the bins B , as best shown in Fig. 3, and in each bin are gates or valves h , which control openings into the conveyer-trough f extending beneath. These gates or valves h may be controlled by screws h' , leading to the outside of the bins, as is best shown in Fig. 3, or by any other suitable means, and by opening any one of these gates or valves h the withdrawal of coal or other material from the bin B controlled by it by the operation of the conveyer F may be produced.

The upper conveyer, F' , has one run or arm extending over the series of bins adjacent to one side of the series, and has the other run or arm extending over the pockets, and from this other run or arm delivery chutes or outlets g' deliver coal into any one of the pockets G . I have shown in the bottom of the trough f of the upper conveyer, F' , openings or traps g^2 , which may be controlled by valves or shutters, and any one of these openings g may be opened, according as it is desired to deliver coal into any particular one of the bins B or the pockets G .

The reversible chain of scrapers f' of the lower and upper conveyers, F F' , are mounted upon supporting and guiding wheels f^2 , and each of said two endless chains of scrapers passes around a supporting and operating wheel, f^3 . Upon the shaft f^5 , before described, are reversed bevel-pinions f^4 , which may be shifted, so as to either one of them engage with the larger bevel-wheel, f^6 , upon the shaft of the supporting and operating wheel f^3 of the lower conveyer, F , and by shifting these bevel-pinions f^4 the shaft f^5 by rotating always in one direction may impart motion in either direction, as desired, to the endless chain of scrapers f' of the lower conveyer, F .

The endless chain of scrapers f' of the up-

per conveyer, F' , is mounted upon supporting and guiding wheels f^2 , and also upon a supporting and driving wheel, f^3 , and upon the same shaft with said supporting and driving wheel f^3 is a large bevel-wheel, f^6 , with which may be engaged one or the other of two bevel-pinions, f^4 , upon a shaft, f^7 . f^8 is a main driving-shaft to which motion may be imparted by a belt passing over a pulley, f^9 , and which by bevel-gearing f^{10} imparts motion to the shaft f^7 , and thus operates the upper horizontal conveyer, F' . f^{11} designates a counter-shaft connected by bevel-gearing f^{12} with the shaft f^5 , and which may be driven by a belt passing around pulleys f^{13} upon the shafts f^8 f^{11} .

The inclined conveyer or elevator F^2 includes a trough, f , of rectangular section and an endless chain of scrapers, f' , which are supported by wheels f^2 at the top and bottom of the run, as best shown in Fig. 2, and motion is imparted to this endless chain of scrapers f' of the inclined conveyer F^2 by bevel-gearing f^{14} from the shaft f^7 .

From the above description it will be understood that the direction of movement of the endless chain of scrapers f' of either the lower horizontal conveyer, F , or the upper horizontal conveyer, F' , may be reversed, as may be desired. In the operation of my apparatus the coal which is delivered by the screen D' to the first horizontal conveyer, F^3 , is by said conveyer delivered to the inclined conveyer or elevator F^2 , and by the latter is raised and delivered to the upper horizontal conveyer, F' . Meanwhile the endless chain of scrapers f' of the horizontal conveyer F' are being moved to carry the coal through either of the two runs or arms of that conveyer, according as it may be desired to deliver the coal to one of the bins B or to one of the pockets G .

If it is desired to deliver to any one of the bins, the endless chain of scrapers f' of the upper conveyer, F' , is moved in the direction to carry the coal down that run or arm of the conveyer, and the delivery-opening g^2 in the bottom of the trough f , which corresponds to the desired bin is opened, so that the coal may be delivered thereinto. If, on the contrary, it is desired to deliver coal by the upper conveyer, F' , into any one of the pockets G , the endless chain of scrapers f' is moved in a reverse direction and the outlet-chute g' of the desired pocket G is opened, and then that pocket will receive the coal.

By means of the lower horizontal conveyer, F , coal may be taken at any time from any one of the bins and delivered at the foot of the inclined conveyer or elevator F^2 , and then raised by that inclined conveyer or elevator and delivered to the upper horizontal conveyer, F' , which will, as before described, deliver the coal into any one of the bins other than that from which it was taken or into any one of the pockets G .

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the frame-work, as D' , having slideways, as d^{10} , of an endless chain of buckets, wheels journaled in boxes fitting said slideways and arranged to rotate in the same plane, whereby the chain of buckets is caused to travel in a straight line in passing between the said wheels, and a pair of toggle-levers having their end joints connected with the wheel-journals, and an adjusting-screw connected with the middle joint of the toggle-levers for adjusting them to vary the distance of the wheels apart, substantially as herein described.

2. An apparatus for handling and distributing granular or lumpy substances, comprising a series of bins and a series of pockets each having a delivery-outlet, and a substantially-horizontal endless chain conveyer having two parallel intercommunicating runs extending one over the series of bins and the other over the series of pockets, the said conveyer being reversible and its runs having delivery-outlets, those of one run being over the several bins and those of the other run being over the several pockets, substantially as herein described.

3. An apparatus for handling and distributing granular or lumpy substances, comprising a series of bins and a series of pockets, each having a delivery-outlet, and a substantially-horizontal endless chain conveyer having two intercommunicating runs extending one over the series of bins and the other over the series of pockets, the said conveyer being reversible and its runs having delivery-outlets, those of one run being over the several bins and those of the other run being over the several pockets, and an inclined conveyer for receiving the material and delivering it to the said horizontal conveyer, to be thereby delivered to any one of the bins or to any one of the pockets, substantially as herein described.

4. An apparatus comprising a series of bins arranged side by side and a series of elevated pockets similarly arranged, and each having a delivery-outlet, a lower substantially-horizontal conveyer having two runs for taking material from any bin and reversible in its direction of movement, an upper substantially-horizontal conveyer having two runs or arms, respectively, over the bins and pockets, also reversible in its direction of movement, and having outlet-openings, those of one run being into the bins and those of the other run into the pockets, and an inclined conveyer into which material is delivered by the lower conveyer, and by the inclined conveyer delivered to the upper conveyer, substantially as herein described.

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Witnesses:

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HENRY J. MCBRIDE.